



March 26, 2007

Ms. Ellen Jackson, Project Geologist  
Maryland Department of the Environment  
Oil Control Program  
1800 Washington Blvd.  
Baltimore, Maryland 21230

• *Engineering*  
• *Remediation*  
• *Consulting*

**Re: Groundwater Sampling Work Plan  
Wally's Citgo  
19200 Middletown Road  
Parkton, Maryland  
MDE Case # 2006-0319-BA2**

Dear Ms. Jackson:

Environmental Alliance, Inc. (Alliance) ) on behalf of Carroll Independent Fuel Company (CIFC) has prepared this *Groundwater Sampling Work Plan (Work Plan)* to address Requirement (1) presented within in the Maryland Department of the Environment Oil Control Program (MDE - Oil Control) correspondence dated March 21, 2007. This requirement specifies the following.

- ◆ The collection of groundwater samples from all site monitoring wells including wells MW-7B, MW-8B, and MW-9B.
- ◆ Collection of the groundwater samples must be completed no later than April 5, 2007.
- ◆ Groundwater samples must be laboratory analyzed for full-suite volatile organic compounds (VOCs), including fuel oxygenates, using EPA Method 8260 and for total petroleum hydrocarbons-diesel range organics and total petroleum hydrocarbons-gasoline range organics (TPH-DRO and TPH-GRO, respectively) using EPA Method 8015B.

Details of the groundwater sampling activities for implementation by Alliance to satisfy Requirement (1) are provided in the following sections.

### **Sampling Event Schedule**

Alliance has scheduled a groundwater sampling event for April 3<sup>rd</sup> and 4<sup>th</sup> to satisfy the MDE – Oil Control Requirement (1) of conducting this sample event by April 5<sup>th</sup>, 2007. Alliance encourages MDE to be in attendance for this sampling event if possible. Should MDE – Oil Control wish to attend this event, but is unable to attend as currently scheduled, contact Alliance so that we may discuss rescheduling of this event.

### **Sampling Methodology For Upper Bedrock Groundwater Wells**

Alliance will use the sampling methodology provided in the MDE - Oil Control's February 2003 (revised) Maryland Environmental Assessment Technology (MEAT) guidance document for leaking underground storage tank sites (Appendix A) that has been used at the site previously to collect groundwater samples from the well locations intercepting first groundwater. In general, this preferred groundwater sampling method consists of pumping (purging) a well until the calculated equivalent of three well bore volumes have been removed and then using a bailer to obtain a sample from the well. Note that all purge groundwater generated by the sampling activities will be containerized for off site transport and disposal as required by MDE - Oil Control.

### **Sampling Methodology For Lower Bedrock Groundwater Wells**

Alliance will attempt to use the preferred groundwater sampling methodology in the MDE - Oil Control's MEAT guidance document at wells MW-7B, MW-8B, and MW-9B that involves the purging of a well until the calculated equivalent of three well bore volumes have been removed and then using a bailer to obtain a composite groundwater sample from the well per Requirement (1). However, due to the low yield conditions observed at these well locations, it is more than likely that no more than one well volume can be removed from each location before each well location is pumped dry. As presented in the Hydrogeologic Investigation Update Report and Work Plan (Alliance, February 2007), the "B" level wells have a very limited groundwater yield. Monitoring wells MW-7B and MW-8B took over ten weeks to reach a static water level after drilling, with an estimated flow of less than 0.005 gallons per minute (gpm). Monitoring well MW-9B has a slightly greater yield at a possible 0.1 gpm flow.

In order to comply with the MDE - Oil Control's MEAT guidance document, which requires groundwater purging to cease if a well is at dry or near dry conditions and a groundwater sample be collected after the well has recharged, Alliance proposes implementing the following procedures.

- ◆ An attempt to purge each well location of three well bore volumes will be made before collection of a composite groundwater sample via a bailer.
- ◆ Should purging at a well location remove a maximum of 70 % of the groundwater volume capacity contained within a well bore (based on the initial static water level depth and total well depth measurements), purging of a well location will cease to prevent dewatering of the well bore per the MDE - Oil Control's MEAT guidance document.
- ◆ Groundwater within a well location will be allowed to recharge overnight or a maximum of 18 hours from purge cessation before collection of a groundwater sample from a well location with a bailer (sample depth within the top 5 feet of the water column at the time of sampling). This procedure addresses the slow recharge (weeks) for return to approximate static groundwater level observed at these well locations that would exceed the April 5, 2007 deadline required by MDE – Oil Control in Requirement (1) to collect composite groundwater samples from these wells. Please note that this procedure is not consistent with the MDE - Oil Control's MEAT guidance document, which requires collection of a groundwater sample from a well upon recharge.

An alternative to the above proposed sampling method (also provided in the MDE - Oil Control's MEAT guidance document) involves implementing low-flow sampling of specific areas associated with fracture zones using a 2-inch Grunfos™ variable speed submersible pump (without sealing off sample intervals with packers). Sampling alternatives for wells MW-7B, MW-8B, and MW-9B were previously discussed with MDE – Oil Control in a February 22, 2007 conference call. This alternate method may still not be fully appropriate for sampling due to the low yield of the wells and this method would not satisfy the collection of a composite groundwater sample from each of these wells specified by MDE – Oil Control in Requirement (1).

Another alternative provided in the MDE - Oil Control's MEAT guidance document is the use of the no purge sampling method. This method would involve the sampling of stagnant well groundwater via a bailer (lowered within the top 5 feet of the groundwater column) that would not necessarily be indicative of formation groundwater. Additionally, a groundwater sample collected by this method would not be a composite of groundwater from the well bore or comparable to the potable well grab samples since potable wells intersect usable (usually greater than 2 gpm yield) groundwater bearing formations and are purged (daily) during normal use of the water within a home/business.

Overall, this sampling method does not provide a sample of representative conditions of groundwater or meets the MDE – Oil Control Requirement (1) of collecting a composite groundwater sample of the well bore.

Per our understanding of the MDE - Oil Control's MEAT guidance document, MDE – Oil Control should approve the proposed sampling methodology for wells MW-7B, MW-8B, and MW-9B before Alliance initiates the sampling event April 3<sup>rd</sup> and 4<sup>th</sup>, 2007. Therefore, if MDE – Oil Control has any questions or comments regarding the proposed sampling method, or wishes to consider an alternative sampling method to implement for wells MW-7B, MW-8B, and MW-9B other than what Alliance has provided, we will require a timely response to move forward with the scheduled *Work Plan* activities without exceeding the Requirement (1) schedule. Note that all purge groundwater generated by and of the sampling activities implemented for these wells will be containerized for of site transport and disposal as required by MDE - Oil Control.

Please feel free to contact me at (302) 995-7544 if you have any questions or require additional information regarding this *Work Plan*. As we are operating under a tight schedule to satisfy MDE – Oil Control's specified requirements and time table, your timely approval of or noted changes to this *Work Plan* is appreciated.

Sincerely,

**ENVIRONMENTAL ALLIANCE, INC.**



Andrew J. Applebaum  
Geological Services Manager

C: Mr. Howard Phelps, Carroll Independent Fuel Company  
Mr. Dan Kucharski, Carroll Independent Fuel Company  
Ms. Yolande Norman, MDE  
Mr. Herbert Meade, MDE  
Mr. Horacio Tablada, MDE  
Mr. Kevin Koepenick, Baltimore County – DEPRM

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